

Photon-noise limited kinetic inductance polarimeter and detector arrays

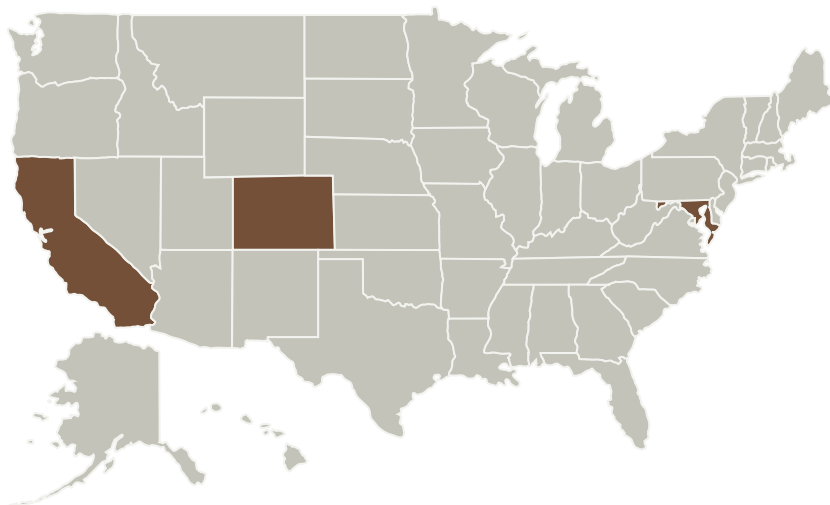
Completed Technology Project (2015 - 2017)



Project Introduction

The objective of the proposed work is to develop a general microwave kinetic inductance detector (MKID) technology that achieves photon-noise limited performance over a broad range of frequencies (150 GHz - 1.2 THz) with unprecedented low-frequency stability, polarization-sensitive capability, and over the range of loading conditions suitable for sub-orbital and satellite missions. The detector technology uses a new superconducting material, a TiN/Ti/TiN trilayer, together with proven feedhorn optical coupling. The strength of the approach is evidenced in a recent breakthrough result, in which we have demonstrated photon-noise limited sensitivity in MKIDs developed for BLAST, a NASA-funded balloon-borne polarimeter.

Primary U.S. Work Locations and Key Partners



Organizations Performing Work	Role	Type	Location
National Institute of Standards and Technology(NIST)	Supporting Organization	US Government	Boulder, Colorado

Primary U.S. Work Locations	
California	Colorado

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Organizational Responsibility

Responsible Mission Directorate:

Science Mission Directorate (SMD)

Responsible Program:

Astrophysics Research and Analysis

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Primary U.S. Work Locations (*cont.*)

Maryland

Project Management

Program Director:

Michael A Garcia

Program Manager:

Dominic J Benford

Principal Investigator:

Gene C Hilton

Co-Investigators:

Johannes Hubmayr

Kent D Irwin

Michael R Vissers

Jose A Aumentado

Jiansong Gao

David P Pappas

Technology Areas

Primary:

- TX08 Sensors and Instruments
 - └ TX08.1 Remote Sensing Instruments/Sensors
 - └ TX08.1.1 Detectors and Focal Planes

Target Destination

Outside the Solar System